

Template 3. Small Forest Landowner Thinning Strategies for Riparian Management Zones, Western Washington (For use by Small Forest Landowners only)

Background

The DNR Small Forest Landowner Office (SFLO) is directed to develop Alternate Plans including templates for the smaller harvest units that characterize small forest landowner (SFL) harvests that may have a relatively low impact on aquatic resources. Many small forest landowners find the process to determine if their timber stands are eligible for riparian inner zone harvest to be expensive to evaluate and complex to implement. The effect can often be a loss of timber income.

Purpose

This template provides “thinning strategies” within riparian management zones (RMZ) adjacent to Type S, F, and Np Waters. The template also reduces the complexity of the regulatory requirements and the need for significant technical expertise not readily available to small forest landowners.

Process

Landowners submit a completed *Small Forest Landowner Thinning Strategies for Riparian Management Zones* template form, available from DNR, with their forest practices application (FPA) form. This form provides the technical justification required by WAC 222-12-0401(3) (b), (c), and (d), to explain how this Alternate Plan protects riparian function.

It is expected that a landowner using this template will have greater harvest opportunities at lesser operational costs, while still providing comparable protection to the standard forest practices rules for stream buffering. As for any proposed Alternate Plan, however, an Interdisciplinary Team may be used to review the applicability of this template to site-specific harvests (see WAC 222-12-0401(5)).

Landowners planning to conduct a harvest within a RMZ adjacent to Type S Waters (protected by the Shoreline Management Act, RCW 76.09.910) must consult with the city or county of jurisdiction to determine if the proposed activities comply with the local shoreline master plan. If a Substantial Development Permit is required, landowners must include a copy of the permit with the FPA.

Alternate Plan Harvest Prescriptions – Stream Buffers for Small Forest Landowners

This template offers alternative prescriptions for timber harvest within the riparian forest stands owned by small forest landowners. A SFL submitting an FPA and applying all of the prescriptions of the *Small Forest Landowner Thinning Strategies for Riparian Management Zones*

template will achieve the protective standards of WAC 222-30-010(11) through WAC 222-30-022.

(1) Equipment Exclusion Zone Along all Streams in Western and Eastern Washington¹

An equipment exclusion zone applies within a 30-foot wide zone measured horizontally from the outer edge of bankfull width (BFW) or the channel migration zone (CMZ), whichever is greater. This requirement applies to all stream types.

(2) Type Np Stream Buffers for Western and Eastern Washington.

(a) Eligibility. Eligible stands adjacent to Type Np Streams are those owned by small forest landowners without stream adjacent parallel roads within 50 feet of the outer edge of BFW or the CMZ, whichever is greater.

(b) Buffering of Sensitive Sites. Buffer all sensitive sites adjacent to Np Waters, as defined in WAC 222-16-010, WAC 222-30-021(2) and WAC 222-30-022(2), and shown in the Table 1:

Table 1. Sensitive site buffers

Western Washington	
Sensitive Sites	No-Harvest Zone
Headwall Seeps	Within 50 feet of the outer perimeter of the perennially saturated soil zone
Side-slope Seeps	Within 50 feet of the outer perimeter of the perennially saturated soil zone
Headwater Springs or, in the absence of a headwater spring, on a point at the upper most extent of a Type Np Water as defined in WAC 222-16-031.	Within a 56-foot radius of spring center
Intersection of Type Np Waters	Within a 56-foot radius of intersection point of the streams
Alluvial fans	No harvest directly on fan

¹ Eastern Washington means the geographic area east of the Cascade crest from the International border to the top of Mt. Adams, then east of the ridge line dividing the White Salmon River drainage from the Lewis River drainage, and east of the ridge line dividing the Little White Salmon River drainage from the Wind River drainage to the Washington-Oregon state line.

Western Washington means the geographic area west of the Cascade crest.

(c) Riparian Buffer Requirements for Np Waters

(i) For the first 500 feet above the junction with any Type S or F Water, a 50-foot no-harvest zone is required from the outer edge of BFW or the CMZ, whichever is greater,

(ii) For the remaining length of the Type Np Water within the area covered by this template, a 50-foot riparian buffer is required from the outer edge of the BFW or the CMZ, whichever is greater. The buffer is required to have a 30-foot no harvest zone and an adjacent 20-foot thinning zone. The harvest and retention requirements for the Type Np Water thinning zone are shown in Table 2².

Table 2. Total conifer trees per acre to be left unharvested in the Type Np Water thinning zone under the Westside thinning prescriptions. See table notes.

Number of Live Conifer Trees to be Left After Harvest (RD 50)		Conifer Even Spacing Guidelines
Average Stand Diameter	Trees per Acre	Average Spacing
≤12	221	14
13	196	15
14	175	16
15	159	17
16	143	17
17	131	18
18	120	19
19	111	20
20	103	21
21	95	21
22	89	22
23	83	23
24	78	24
25	74	24
26	69	25
27	65	26
28	62	27
29	59	27
≥30	57	28

² This section overrides the Forest Practices Rule requirement to leave 50% of the entire length of the Np Water or 300' whichever is greater.

Table Notes:

- 1) Average stand diameter classes are in inches measured at breast height.
- 2) Only trees with a diameter ≥ 6 inches can be used in calculating average pre-harvest stand diameter class.
- 3) All leave trees in excess of the required 57 largest conifer trees per acre are to be evenly spaced throughout the RMZ. Spacing guidelines provided in feet.
- 4) Landowners having management zones with more than 300 trees per acre consisting of at least 70% conifer may benefit more from using the Overstocked Stand Template in the Board Manual (M21-9).

(3) Thinning Riparian Forests along Type F and Type S Waters (fish-bearing streams).**(a) Western Washington**

- (i) Eligibility. Eligible stands are those which meet all of the following criteria:

- (A) Owned by small forest landowners,
- (B) Meets the required tree stand density, listed in Table 3, for the No-Harvest Zone, which is the area within 50 feet of outer edge of BFW of the stream or any CMZ, whichever is greater,
- (C) Not to be harvested by yarding across the stream,
- (D) May not have stream adjacent parallel roads within the RMZ, and
- (E) The pre-harvest stand must have a live crown ratio of $\geq 30\%$ ³.

Table 3. No-Harvest Zone must meet the required number of trees per acre by diameter class (all species) to be eligible for timber harvest within the Western Washington tree thinning zone.

Average Stand Diameter (in inches measured at breast height)	Trees per Acre All Species	Average Tree Spacing (in feet)
≤ 16	115	19
17	104	20
18	96	21
19	88	22
20	82	23
21	76	24
22	71	25
23	66	26
24	62	27
25	58	27
26	55	28
27	52	29
≥ 28	50	30

³ Live crown ratio refers to the percentage of the tree height that includes live branching. Trees absent branching for 65% or more of their trunk will generally not respond well to thinning.

- (ii) Riparian Management Zone. This template uses the RMZ widths established in Small Forest Landowner Template 2 *Fixed-Width RMZ*. The width of the RMZ used in applying these prescriptions (Table 4) is dependent on the site class of the harvest location. RMZ width is measured horizontally from the outer edge of BFW or the outer edge of any CMZ, whichever is greater. For eligible stands in western Washington, this template replaces the riparian requirements outlined in WAC 222-30-021.

Table 4. Riparian management zone widths for the five Western Washington site classes (Use legal property description at <http://fortress.wa.gov/dnr/app1/fpars/viewer.htm>).

Site Class	Width of RMZ (feet)
I	145
II	118
III	101
IV	82
V	75

- (iii) No-Harvest Zone. No harvest is permitted within the first 50 feet from the outer edge of BFW or any CMZ, whichever is greater.
- (iv) Tree Thinning and Retention Zone Requirements. The following conditions comprise the leave tree requirements within the harvested portion of the RMZ:
- (A) A minimum number of conifer trees based on the average stand diameter class (see Table 5) must be left on site after thinning, and in all cases these must include 57 conifer trees per acre representing the largest stand size class available before harvest. All leave trees in excess of the required 57 largest conifer trees per acre are to be evenly spaced throughout the RMZ.
- (B) In general, tree harvest is a thinning from below, where, after harvest, the average stand diameter for all remaining trees is larger than the average stand diameter before harvest. The guideline for this is $d/D < 1$, see box below. The simplest way to achieve this is to paint-mark trees to be left unharvested beginning with the largest size class and working smaller until the required number of leave trees has been identified.
- (C) Some dominants and co-dominants may be harvested as long as the residual $d/D < 1$ remains.

To determine $d/D < 1$, first calculate the quadratic mean diameter of the trees to be cut (d), next calculate the quadratic mean diameter of the stand prior to thinning (D), then compare the ratio of d/D to assure the value is less than one.

Table 5. Total conifer trees per acre to be left unharvested in the Western Washington Tree Thinning Zone. See Table Notes

Number of Live Conifer Trees to be Left After Harvest (RD 50)		Conifer Even Spacing Guidelines
Average Stand Diameter	Trees per Acre	Average Spacing
≤12	221	14
13	196	15
14	175	16
15	159	17
16	143	17
17	131	18
18	120	19
19	111	20
20	103	21
21	95	21
22	89	22
23	83	23
24	78	24
25	74	24
26	69	25
27	65	26
28	62	27
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≥30	57	28

Table Notes:

- 1) Average stand diameter is in inches measured at breast height.
- 2) Only trees with a diameter ≥ 6 inches can be used in calculating average pre-harvest stand diameter class.
- 3) All leave trees in excess of the required 57 largest conifer trees per acre are to be evenly spaced throughout the RMZ. Spacing guidelines are provided in feet.
- 4) Landowners having management zones with more than 300 trees per acre consisting of at least 70% conifer may benefit more from using the *Overstocked Stand Template* in the Board Manual (M21-9).

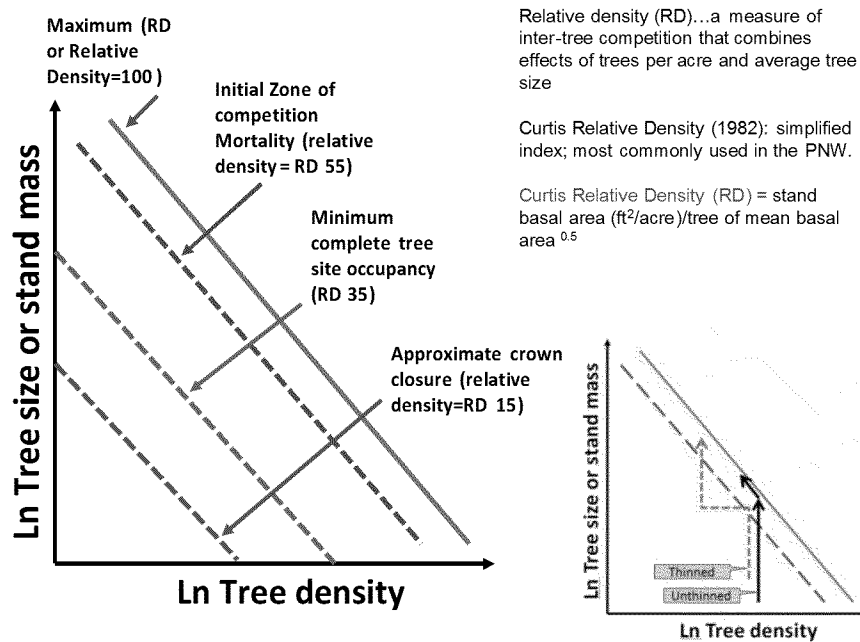
- (v) Down Wood Requirements. All down wood existing prior to harvest should be left within the harvested portion of the RMZ.

Guidance to assist in determining the specific number of leave trees. To convert the trees per acre requirement into trees per linear distance (in feet) for ease of use, insert the appropriate RMZ Width (“Width”) and required Trees Per Acre (“TPA”) into the following equation along with the length (“Length”) of the harvest along the stream. Trees left in RMZ harvest area per linear foot = $[(\text{Width} * \text{Length}) / 43560] \times \text{TPA}$

(5) DNR to Prevent Material Damage to Public Resources. Nothing in these low impact prescriptions ((1) – (4) above) reduces or eliminates the department’s authority to prevent actual or potential material damage to public resources under WAC 222-20-055.

(6) Landowner to Meet SMA Requirements. Landowners planning to conduct a harvest within a riparian management zone adjacent to Type S Waters (protected by the Shoreline Management Act, RCW 76.09.910) must consult with the city or county of jurisdiction to determine if the proposed activities comply with the local shoreline master plan. If a Substantial Development Permit is required, landowners must include a copy of the permit with the FPA.

Figure 1. Relative Density and Thinning Opportunities



Sideboards on RMZ stand management

	Douglas-fir or spruce predominance	Western hemlock, western redcedar, or true fir predominance
Best thinning range:	$55 \leq RD \leq 60$	$65 \leq RD \leq 70$
Acceptable thinning range:	$55 \leq RD \leq 80$	$65 \leq RD \leq 90$
After thinning, there should be:	<p>Crown Ratio ideally $\geq 35\%$</p> <p><u>Height/diameter ratio</u> < 95</p> <p>Stand BA reduced by approximately 30 percent (<u>no more</u> than a 40% reduction of pre-thinning RD except when managing specific cohorts and risk has been documented as acceptable)</p>	

Table 1. Relationship of Basal Area and Trees per Acre to Relative Density

Relationship of Basal Area & Trees/acre or Spacing to Relative Density																			
Basal Area	Tree/acre & Spacing																		
	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	
	42x42	30x30	24x24	21x21	19x19	17x17	16x16	15x15	14x14	13x13	13x13	12x12	12x12	11x11	11x11	10x10	10x10	10x10	
40	10	11	13	14	14	15	16	16	17	17	18	18	18	19	19	19	20	20	
60	13	16	17	19	20	21	21	22	23	23	24	24	25	25	26	26	27	27	
80	16	19	21	23	24	25	26	27	28	29	30	30	31	31	32	33	33	33	
100	19	23	25	27	29	30	31	32	33	34	35	36	36	37	38	38	39	40	
120	22	26	29	31	33	34	36	37	38	39	40	41	42	43	43	44	45	45	
140	25	29	33	35	37	39	40	42	43	44	45	46	47	48	49	49	50	51	
160	27	33	36	39	41	43	44	46	47	49	50	51	52	53	54	55	56	56	
180	30	36	39	42	45	47	49	50	52	53	54	56	57	58	59	60	61	62	
200	32	38	43	46	48	51	53	54	56	57	59	60	61	63	64	65	66	67	
220	35	41	46	49	52	54	56	58	60	62	63	64	66	67	68	69	70	71	
240	37	44	49	52	55	58	60	62	64	66	67	69	70	72	73	74	75	76	
260	39	47	52	56	59	62	64	66	68	70	72	73	75	76	77	79	80	81	
280	42	49	55	59	62	65	68	70	72	74	76	77	79	80	82	83	84	86	
300	44	52	58	62	66	69	71	74	76	78	80	82	83	85	86	88	89	90	
320	46	55	61	65	69	72	75	77	80	82	84	86	87	89	90	92	93	95	
340	48	57	63	68	72	75	78	81	83	86	88	90	91	93	95	96	98	99	
360	50	60	66	71	75	79	82	84	87	89	91	93	95	97	99	100	102	103	
380	52	62	69	74	78	82	85	88	91	93	95	97	99	101	103	105	106	108	
400	54	65	72	77	81	85	88	91	94	97	99	101	103	105	107	109	110	112	